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AGRO-ECONOMICS AND ORGANIZATION

PRIVATE OWNERSHIP OF LIVESTOCK BY CITY-DWELLERS IN CHECHEN-INGUSH ASSR

Moscow SEL'SKAYA ZHIZN' in Russian 20 Aug 80 p 2

[Article by A. Kindarov, chairman of the Executive Committee of the Gudermes Municipal Council of People's Deputies: "If City-Dwellers Maintain Livestock"]

> [Text] The organization of associations for the joint procurement of feed is making it possible to overcome the difficulties associated with supplying the private plots with forage.

For centuries the mountain people have engaged in livestock husbandry operations. And although at the present time the entire tenor of their lives is changing radically -- many are working at enterprises and in transport, construction and the sphere of services -- the old traditions have still not disappeared. In addition to rural residents, many city-dwellers are also striving to engage in livestock raising on their plots. But what about feed? Indeed, in our region, similar to many others, each tract of land deemed suitable for farming has been plowed up; very few natural pasture and haying lands remain.

We have been awaiting a solution for this problem for a long period of time. Finally a solution was found and, strangely enough, it was found in the city rather than in the countryside.

Many residents of the city of Gudermes are also maintaining livestock. Earlier they grazed their animals on unused municipal land. But such tracts became fewer and fewer. The neglected animals wandered through the streets causing damage to shrubs and trees. Thus it was that several years ago, based upon authorization by the municipal executive committee, a group of livestock owners plowed up the remaining waste land and planted it in Sudan grass. This represented the beginning of an association for the procurement of feed for the privately owned livestock of city-dwellers. Today this association, which consists of 600 families, has been assigned 400 hectares of previously unused municipal land for use on a temporary basis.

The Gudermes Association acquired its own tractor, sowing machines, mowing machines and seed storehouse. Each member of the association annually procures 1.5-2 tons of hay for his own use and up to 20 tons of seed are produced here on a joint basis.

Recently, similar associations have sprung up also in Novogroznenskiy Settlement, Suvorov-Yurt, Dzhalka, Braguny, Gerzel'-Aula and in other populated points throughout the region. The municipal executive committee developed and approved a model statute for the association, for the joint procurement of livestock feed for the private plots of citizens. Each association develops its own statute based upon this document. This year, there are already 14 associations operating throughout the region.

The associations in Gudermes and Novogroznenskiy Settlement utilize municipal land and in villages the land tracts are made available by the farms for a year's use. The sizes of the tracts vary greatly -- from 30 to 60 hectares, depending upon the available potential. In associations which were formed on the basis of sovkhoz lands, all of the work -- from plowing to the delivery of hay to a dwelling -- is organized by the management of a farm. At the end of the year, the sovkhoz determines the overall cost of the work and presents a bill to the association. The administration pays for this work using the dues paid in by shareholders. On almost all of the farms, forest strips and tracts of unsuitable land are made available for use by the associations.

Each member of an association is obligated to observe the statute, participate in a conscientious manner in the sale of surplus animal husbandry products to the state and carry out the veterinary-sanitary rules for the maintenance of livestock in a strict manner.

The highest organ of an association is the general meeting and during the period between meetings -- the administration -- which is elected for a year. The larger associations are authorized to have full-time chairmen, cashier-accountents and watchmen. The financial operations are based upon the entrance dues and the value of the feed.

The advantages of such assistance to the owners of the livestock are obvious. During the years of the Tenth Five-Year Plan, the number of long-horned cattle increased from 7,300 to 9,100 head. During this same period, the population sold 2,440 head of young stock to the farms and it sold to the state 1,470 tons of meat, approximately 100 tons of wool and almost 2 million eggs. In addition, during the past 4 years, 1,300 tons of vegetables, 6,562 tons of fruit and 1,592 tons of grapes were sold to procurement organizations from the private plots. This represents a worthy increase for the dining tables of the city-dwellers. Large quantities of vegetables, fruit, berries and melon products were sold on the kolkhoz market.

Beyond any doubt, the situation would have been even better if success had been achieved in overcoming the serious shortcomings noted in the organization of procurements. The time is at hand for organizing an efficient system for concluding agreements for the procurement of products. We are still encountering, all too frequently, incidents of procurement specialists declining to accept tomatoes, garlic and onions which were grown on private plots. Last year, more than 100 tons of garlic rotted throughout the region. Many misunderstandings arise in connection with determining the state of nourishment of the livestock.

At the present time, we are studying the possibility of maintaining private plots not only among the population but also at enterprises and in the sphere of trade and public catering. Today the procurement office of the raypo [rayon consumers' society] has a rabbit farm for 300 does. A brick plant and a medical instrument plant conduct fishing operations and a locomotive depot is erecting a hothouse. In addition to focusing greater attention on development of the private economy among the population, this will undoubtedly make it possible to increase substantially the production of many valuable food products.

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PROBLEMS IN FURTHER DEVELOPMENT OF SIBERIAN GRAIN ECONOMY DISCUSSED

Omsk ZEMLYA SIBIRSKAYA, DAL'NEVOSTOCHNAYA in Russian No 9, Sep 80 pp 8-10

[Article by N. M. Batitov, senior scientific associate, SibNIIESKh, candidate of economic sciences: "Problems of Development of Grain"]

[Text] In the course of the contemporary scientific-technical revolution the economy is making ever-growing demands for both the quantity and the quality of grain. In his talk at the meeting of the party and economic aktiv of Kazakhstan in 1974, L. I. Brezhnev, returning to the question of the necessity of increasing grain production, emphasized that "the country does not need grain in general, it needs good-quality grain in a broad assortment. For this reason, our grain economy faces a challenge of not just increasing production but also improving the structure of grain output."

There have been significant changes in the structure of grain consumption in recent years. In the first three years of the 10th Five-Year Plan in Western Siberia, for example, 50 percent more grain was used to feed livestock than in 1966-1970. The consumption of food grain practically stabilized, while feed grain for livestock, owing to the need to increase the production of animal husbandry products, rose considerably. This trend will continue in the future. Calculations show that while the total volume of feed consumption rises 60-65 percent the use of concentrates increases 86-90 percent. The proportion of grain used for livestock feed will rise to 50-60 percent of the gross grain harvest. At the same time the structure of grain production in the oblasts and zones is increasingly favoring feed production, which can be seen in the example of Tyumenskaya Oblast. Over a period of 10 years (1968-1978), the proportion of barley rose 14 percent and oats 19 percent, while the share of wheat dropped 30 percent. The change in the structure of grain production was also reflected in the structure of state grain purchases. In 1968 wheat accounted for 83 percent of the total volume of state purchases, but in 1978 it was just 48 percent. At the same time the share of oats rose to 30 percent and barley to 15 percent, whereas in 1968 this crop was not represented in state purchases.

Similar structural changes have taken place in Kemerovskaya and Tomskaya oblasts and in the forest-steppe and taiga-subtaiga rayons of Omskaya and Novosibirskaya oblasts. These trends, which are occurring in Eastern Siberia and the Far East, testify that large zones are gradually forming in the eastern region where grain production is becoming a key production sector whose structure is decisively influenced by the developing needs of animal husbandry.

Against this background of improvement in the structure of production of feed grain a certain discrepancy has come about between the need for different types of food grain and their local production. In Siberia and the Far East in 1976, for example, the volume of state purchases relative to needs calculated by accepted norms were: about 11 percent for strong wheat, 25 percent for durum wheat, 33 percent for rye, 74 percent for rice, 44 percent for millet, and 34 percent for buckwheat. An analysis made by us in Novosibirskaya Oblast revealed that with the grain part of its diet the population is receiving significantly less full-value protein than it should because buckwheat, peas, and oats do not constitute a sufficient proportion. A marked worsening of the content and quality of gluten in durum and strong wheat varieties led to a reduction in state purchases of these valuable grains. In these regions state purchases of durum wheat dropped from 150,000 tons in 1972 to 80,000 in 1978, while state purchases of strong varieties rose significantly in Omskaya oblast, but dropped sharply in Altayskiy Kray. In 1966-1970 an average of 185,000 tons of strong wheat a year was purchased there, whereas in 1971-1975 it was 40,000 tons and in 1978 just 13,000 tons was purchased.

The production of low-value grain makes it difficult to provide the population with good-quality bread and macaroni products and reduces the national economic efficiency of the grain economy. An extra 800,000-900,000 tons of wheat grain is required to bake the same amount of bread from grain with poor milling and baking qualities for the eastern region. The region is experiencing a severe shortage of brewing barley; a significant amount of money is being spent to import it.

Mixed feeds comprise just 32 percent of the roughly 12 million tons of concentrated feeds now being fed to livestock. This leads to inefficient use of grain. The mixed feed plants, which do not have stable raw material zones or direct ties with kolkhozes and sovkhozes, cannot influence production and state purchase of feed grain in the required assortment. In 1976-1978 wheat accounted for 79 percent of market grain in Western Siberia, 62 percent in Eastern Siberia, and 44 percent in the Far East. As a result, a large amount of wheat grain is used in the mixed feed industry, which makes it impossible to produce full-value mixed feeds in the required assortment and diminishes their quality.

The established system of grain production, where a broad range of grain crops is grown in all zones, regions, and farms without consideration of their designated uses, does not foster a further increase in gross harvest in the necessary assortment or improvement in grain quality. The structure of grain production and its location by regions of Siberia and the Far East are far from appropriate to the changes in consumption of this output and zonal and interzonal differences in the soil and climatic conditions of production.

It is more profitable to produce barley, oats, and rye in the northern and eastern regions of Siberia. Even in uneven crop rotation conditions these crops produce higher yields than spring wheat there. For example, in the foothill regions of Western Siberia the yield of oats and rye is 8-12 percent higher than that of wheat. Nonetheless, spring wheat accounts for 68 percent of the structure of production, while oats are 13 percent and barley is 14 percent of grain plantings. At the same time oats and barley occupy a significant proportion of grain plantings in the steppe regions where soil and climatic conditions make it possible to get high-quality strong and durum wheat crops. About one-third of all plantings of barley and one-fifth of all oats raised in Western Siberia are concentrated in this zone. Barley surpasses spring wheat by 20-25 percent for yield in the southern and central zones of Amurskaya Oblast and is 60-65 percent better in the Amur-Bidzhan zone of Khabarovskiy Kray. Nonetheless, wheat accounts for 58 and 48 percent of the planted area in these two regions.

The growing demands for quantitative and qualitative indicators of development of the grain economy necessitate major changes in the coming years not only in the level of intensity and sophistication of crop farming but also in the structure and location of grain production. In the future some 6-8 times as much as feed grain will be needed as food grain.

It is becoming very important to further specialize grain production. Raising the same grain crops for different purposes should be viewed as a specific sector of crop farming with its own special technology, production organization, and marketing of output.

A forecast estimate shows that there is a possibility of forming major specialized zones for the production of food and feed grain in each economic region. In this it is necessary to consider the uneven location of grain resources by economic regions. On the average these regions have 0.68 hectares of grain crops per capita, with more in Western Siberia and less in Eastern Siberia. In the structure of arable land grain crops occupy 60, 58, and 38 percent respectively. In 1971-1975 1,250 kilograms of grain was produced per capita in Western Siberia, 785 kilograms in Eastern Siberia, and 185 kilograms in the Far East. In the future, with a significant increase in grain production, the territorial differences will continue. The high degree of territorial division of labor in the production and consumption of particular types of grain will also continue. For example, Altayskiy Kray will sell an average of about 70 percent of the buckwheat and more than 50 percent of the millet purchased by the state in Siberia and the Far East. Altayskiy Kray and Novosibirskaya and Tyumenskaya oblasts account for about 54 percent of all state purchases of rye. Primorskiy Kray is the principal supplier of rice and also produces buckwheat, and so on.

Calculations show that the above-discussed territorial division of labor will be strengthened, which will make it necessary to concentrate the production of particular kinds of grain. It is advisable to concentrate the cultivation of food grain, primarily strong and durum wheat varieties, in 16 regions of the Kulunda, Aley, and Ob' zones of Altayskiy Kray, 10 rayons of the Kulunda and southern part of the Barabinsk zone of Novosibirskaya Oblast, and 17 rayons of the steppe and southern forest-steppe zones of Omskaya Oblast. Part of the food wheat should be produced in the southern rayons of Krasnoyarskiy Kray, Chitinskaya Oblast, and the southern and central zones of Amurskaya Oblast. Plantings of strong wheat varieties should be 4-4.5 million hectares with 400,000-500,000 hectares of durum wheat. Production of market grain of strong wheat variteies should be at least 1.5 million tons with 500,000 tons of durum wheat. In Tyumenskaya and Kemerovskaya oblast and the northern forest-steppe, foothill, taiga, and subtaiga rayons of Omskaya, Novosibirskaya, and Irkutskaya oblasts, and Altayskiy and Krasnoyarskiy krays it would be advisable to expand rye plantings to 550,000-600,000 hectares in order to raise production of this grain to 850,000-900,000 tons in the near future.

Buckwheat plantings should be concentrated in the Biysk-Chumysh and Salair zones of Altayskiy Kray for processing at the Biysk groats combine, in five rayons of the central zone of Kemerovskaya Oblast, and also in several rayons of Chitinskaya Oblast and Krasnoyarskiy, Khabarovskiy, and Primorskiy krays. The total area planted to buckwheat in these zones should be 300,000-310,000 hectares with an average annual gross commodity harvest of 250,000-280,000 tons. It would be advisable to concentrate millet production at a group of farms in the steppe rayons of Omskaya, Novosibirskaya, and Chitinskaya oblasts and Altayskiy and Krasnoyarskiy krays. The total area planted to this crop in the region, depending on yields, should be 120,000-140,000 hectares.

The Suyfun-Khankay zone of Primorskiy Kray must be turned into a national center of rice groats production figured to supply the needs of the population of Siberia and the Far East on the basis of accelerating the construction of irrigation systems and raising the level of intensification in rice farming. The total area planted to rice should be at least 35,000-38,000 hectares.

Considering the distinctive soil and climatic conditions and the need for a significant increase in the production of animal husbandry products, it would be advisable to quit producing market food grain in Tyumenskaya, Kemerovskaya, Tomskaya, and Irkutskaya oblasts, the Buryat and Yakut ASSR's, Khabarovskiy Kray and the northern, forest-steppe, foothill, taiga, and subtaiga rayons of Omskaya, Novosibirskaya, and Chitinskaya oblasts and Altayskiy and Krasnoyarskiy krays, as well as the Amur-Zeya zone of Amurskaya Oblast. Grain production in these areas must be oriented completely to raising market feed grain.

The proposed deepening of grain specialization will demand identification of a network of farms with definite production designation. For example, in the steppe region these will be farms in which the structure of use of arable land and the complex of scientific farming and organizational measures are directed primarily to the production of high quality strong and durum wheat varieties. The development of livestock raising at these farms should be for mixed dairy-meat purposes based on the use of by-products of grain production and feed obtained in specialized crop rotations on arable land and from natural lands, without infringing on the production of strong and durum grain for the market. Both the public herd and privately owned livestock must be provided with all necessary mixed feeds. And all quality wheat grain must go to the state.

It is obvious that the paramount task is to restore the areas planted to durum wheat in the steppe and forest-steppe regions, primarily using new varieties bred in Siberia. This will be greatly aided by the fact that the USSR Council of Ministers by its decree in 1977 raised the price supplement for first and second class durum wheat grain.

It is possible in Altayskiy Kray and Omskaya and Novosibirskaya oblasts to single out groups of kolkhozes engaging in the production of durum wheat in order to raise the area planted to this crop in these regions to 450,000-500,000 hectares by the middle of the next five-year plan and increase the average annual sale to the state of high-quality grain to 250,000-300,000 tons. It is equally important to concentrate plantings of buckwheat and millet at groups of farms in order to raise their share of arable land to 5-7 percent.

In regions where feed grain production is concentrated the kolkhozes and sovkhozes should specialize not only in the production of grain but also the production of grass meal and other raw material for mixed feeds. Around the mixed feed plants it will be necessary to establish raw material zones capable of supporting smooth operations by the plants.

To eliminate the growing disproportion between the need for mixed feeds and their production the capital for construction of mixed feed enterprises of the USSR Ministry of Procurement must be added to the capital of the kolkhozes, sovkhozes, and interfarm associations. This will make it possible to quickly overcome the disorganization in the material-technical base of the mixed feed enterprises,which are expected to make fundamental changes in the production. From what has been said it is clear that it is gradually becoming objectively necessary to combine the production and processing of grain into a single industrial management complex.

From the standpoint of national economic efficiency it is advisable to move the entire harvest of market grain along the route from the field to the elevator and then to the mixed feed, milling, or groats plant. However, this is prevented by the existence of departmental barriers between grain producers and grain procurement workers which results in lack of coordination of the material-technical base for post-harvest grain processing between two departments, agriculture and grain products enterprises. Thus, about 14-15 million tons of grain remains at kolkhozes and sovkhozes of the eastern region each year with capital storage facilities for 3.5-4 million tons; the grain receiving enterprises receive an average of 8-9 million tons a year with storage capacity of 20-21 million tons. Cases frequently occur where farms located next to grain receiving enterprises build small storage facilities while remote farms that need large storage capacities and structures do not have the capital and capacities for this.

As domestic and foreign experience demonstrates, it is possible to increase the nutrient content in each unit of physical volume of grain by 25-30 percent by preservation of the output produced, improving its quality, and using it efficiently. This is equivalent to a significant increase in gross grain production. To solve these problems we must develop agroindustrial integration between agriculture and grain products enterprises.

At the present time the question of economic stimulation of production in each zone for definite types of grain crops is becoming crucial. For example, a single standard has been established for wheat purchased by the state and so everywhere, even in northern regions where it often does not ripen and produces low-quality output, payment is made at prices for food grain, which are much higher than prices for oats and barley.

It goes without saying that the questions posed here are not to be resolved in one year. But we must begin solving them today so that the leading sector of agriculture will fully meet all the demands of the national economy and become more efficient.

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TILLING AND CROPPING TECHNOLOGY

NUMEROUS PROBLEMS OF SIBERIAN POTATO GROWERS REVIEWED

Omsk ZEMLYA SIBIRSKAYA, DAL'NEVOSTOCHNAYA in Russian No 9, Sep 80 pp 2-3

[Article by V. T. Rubtsov, deputy chief of the All-Russian Association Rossemkartofel', candidate of agricultural sciences: "The Urgent Tasks of Our Potato Growers"]

[Text] The agricultural workers of the USSR have been given the important task of increasing the volume of state purchasers of potatoes. The farms of the Russian Federation have a real opportunity to get high yields of potatoes in all regions, Siberia included. The yield in Siberia has risen significantly in comparison with the Seventh Five-Year Plan, and state purchases have also increased. I would particularly like to note the work of the potato growers of Altayskiy Kray where state purchases of potatoes were raised from 22,000 tons in the Seventh Five-Year Plan to 73,000 tons in the 10th Five-Year Plan. State purchases of potatoes have tripled at the kolkhozes and sovkhozes of Omskaya Oblast and doubled in Novosibirskaya, Irkutskaya, and other oblasts. The quality of the potatoes being marketed has improved also.

Potatoes are one of the principal crops in the vast land of Siberia. But supplying potatoes to the population in the region is not satisfactorily organized. In the first four years of the 10th Five-Year Plan the farms of Western Siberia were 400,000 tons short of the plan for state purchases. The same situation is observed in Eastern Siberia. The farms of Chitinskaya Oblast (who are two annual plans behind), as well as Novosibirskaya Oblast and Krasnayarskiy Kray have fallen far short of the plan.

The problems in potato growing cannot be simply blamed on bad years. The main trouble is that the farm managers and specialists and the managers of agricultural agencies have not given enough attention to this crop. The advances of science and progressive experience are introduced too slowly in Siberia, seed potato raising is on a low level, and many farms do not have in-house seed raising at all. Practically no interfarm exchange of nonvarietal seeds for varietal ones is carried on. Flagrant violations of the technology for cultivating and harvesting potatoes frequently occur in many oblasts and poor farming processes are employed.

Seeds play a special role among the scientific farming steps that can insure a further increase in yield. Replacement of nonvarietal seed with varietal seed makes it possible to get an additional 20-50 quintals of potatoes per hectare. Farms which raise tubers of high-yield varieties and high reproductions are guaranteed the planned yields of potatoes. For example, the Tom' Sovkhoz in Tomskaya Oblast and the Ural'skiy and Isaul'skiy sovkhozes in Krasnoyarskiy Kray receive good, stable yields this way even in bad farming years.

The proportion of varietal potato plantings in Eastern Siberia has not risen in the last four years, it has declined from 33 percent in 1976 to 26 percent in 1979. The figure is also low in Western Siberia — 33.3 percent. The farms of Chitinskaya Oblast and the Buryat ASSR plant almost nothing but nonvarietal potatoes.

Seed quality is completely unsatisfactory. Each year the kolkhozes and sovkhozes of Western Siberia plant 80-90 percent uncertified tubers and in Eastern Siberia it is 90-92 percent. The farms of Novosibirskaya Oblast and Altrskay Kray use uncertified seed almost exclusively.

Scientific institutions play a large part in improving seed raising. But we must admit that they are still not working hard enough to distribute and introduce new intensive-type varieties. For example, the regionalized varieties Yenisey and Narymskiy Ranniy, developed by Siberian plant breeders, are not raised in the production fields of Tomskaya Oblast, and the same is true of the Ufimets and Sedov varieties in Altayskiy Kray and the Sedov variety in Novosibirskaya Oblast. The scientific institutions engaged in primary seed raising are not keeping up with demands: only 50-60 percent of the need for elite potatoes is being satisfied.

Scientific research institutions and farms that raise elite potatoes should increase their production so that we get 5-6 tons of elite potatoes per 100 hectares of market fields this year. This will enable Siberian farms to accelerate the transition to universal varietal planting. The urgency of this task is illustrated by the fact that in the last four years Siberian farms (with the exception of those in Irkutskaya Oblast) have not fulfilled the plan for laying in seed potatoes once. Many farm managers deliberately choose not to lay in seed potatoes and avoid the problems of storing them, evidently hoping that they can fill their stock with seed purchases from the population in the spring. This improper practice, which has developed with the connivance of the managers of agriculture agencies, results in the situation where a significant part of the planting in many oblasts is done with nonvarietal seeds.

One of the chief ways to develop the sector is to organize specialized production, which is possible only with a significant level of concentration. This work is going forward successfully at the kolkhozes and sovkhozes of Krasnoyarskiy Kray, where the average area devoted to potatoes at one farm will be increased to 330 hectares (compared to 154 hectares in 1976) and state purchases will rise from 600 to 1,700 tons. In Omskaya Oblast 70 percent of the market potatoes will be produced at specialized farms.

Unfortunately, some oblasts, krays, and ASSR's take a formalistic approach to furthering specialization and concentration in the sector. They do no more than mechanically shift potato planting from some farms to other farms. Practically all farms are engaged in raising market potatoes this year. Each of them accounts for only a few dozen hectares. This kind of dispersion of plantings inhibits intensification of the crop.

At a specialized farm, for example, it is much easier to introduce potato crop rotations with a shortened cycle, which has a positive impact on potato production. In addition to the development of specialized farms we must develop specialization within the farms, that is, concentrate potato plantings in particular divisions, brigades, and the like.

A serious shortcoming of the work of many farms is poor preparation of seed tubers for planting. Contemporary technology demands mechanized preparation of seed which must involve sizing and heating the tubers with warm air. The leading farms use specially equipped sorting points for this purpose.

Good, timely management of the fields is exceptionally important in producing high potato yields. In practice, however, one frequently observes fields overgrown with weeds.

A crucial part of potato management is controlling diseases during the period of plant growth. The questions of treatment against phytophthora are especially urgent today. On the average for the RSFSR it is necessary to give all planted areas at least four treatments. Instead of three or four treatments agricultural agencies basically plan one, and even this modest objective is by no means always achieved. In 1979 only 38 percent of the planned area was treated in Novosibirskaya Oblast. The kolkhozes and sovkhozes of Krasnoyarskiy Kray and Irkutskaya Oblast are not attempting to control phytophthora at all. This work must be organized so that every farm uses not isolated procedures but a modern scientific system to protect plants against phytophthora.

The development and rapid introduction of new higher-yield potato varieties into production is one of the major reserves for improving the efficiency of the sector. Directives of the CPSU Central Committee and USSR Council of Ministers have outlined specific assignments for the development and improvement of plant breeding work. These documents set forth requirements for improving the work of scientific research institutions in the development of new varieties. These varieties should have yields of 400-600 quintals per hectare and comprehensive resistance to the principal diseases; in addition, they should be suited for mechanized cultivation and prolonged storage. Unfortunately, the plant breeders have not kept up with their assignments for production workers.

According to figures from the Scientific Research Institute of Potatoes, each oblast must have at least one variety per 4,000-6,000 hectares, which makes it possible to take fullest advantage of local natural conditions. But this in no way means that, for example, Tomskaya Oblast, where there are about 6,000 hectares, or the Tuvi ASSR, which has about 2,000 hectares of potatoes, should have one variety apiece. In these cases another principle should be followed: each oblast and each farm must have varieties of different maturation groups.

Analysis of the actual situation with regionalization of varietes and varietal seed raising shows that farm specialists and the state varietal seed raising network are not doing an adequate job. In Altayskiy and Krasnoyarskiy krays only six varieties have been regionalized, while in Chitinskaya Oblast it is seven, in Irkutskaya Oblast five, and in Tyumenskaya Oblast four. Most of the regionalized varieties were developed long ago and with our level of seed raising work have already lost their positive varietal characteristics.

Fertilizers play a decisive part in the campaign to raise potato yields. Unfortunately, some farms do not give this matter proper attention. The RSFSR Ministry of Agriculture allocates adequate mineral fertilizers for potatoes: 8-10 quintals per hectare. But Altayskiy and Krasnoyarskiy krays and Novosibirskaya and Chitinskaya oblasts apply just 4-6 quintals per hectare. It is no accident that they usually receive the lowest potato yields in the region and in all Russia.

Significant potato losses occur during storage. But in several oblasts of Siberia the planned volume of construction of potato storage facilities has not been fulfilled. With the current rate of construction it will take another 10 years to build sufficient storage to lay in seed potatoes. In Eastern Siberia in 1979 the plan for construction and launching of potato storage facilities was only five percent fulfilled. The sovkhozes of Krasnoyarskiy Kray planned to build 15,000 tons of storage, but did not build any. The same thing is true of the farms in Chitinskaya Oblast and the Buryat and Tuvi ASSR's where plans for construction of potato storage facilities in 1979 failed completely. The acute shortage of modern potato storage facilities leads to large losses of seed potatoes.

Land reclamation is becoming very important in Siberian potato raising. Nonetheless, the kolkhozes and sovkhozes of Omskaya, Irkutskaya, and several other oblasts raise practically no potatoes on irrigated land. Just 300 hectares (one percent) of the potatoes in Irkutskaya Oblast are irrigated, while in Tomskaya Oblast it is 600 hectares. Furthermore, the potato yield on irrigated lands does not increase. For example, in 1978 the farms of Tomskaya and Irkutskaya oblasts received 95 quintals of potatoes per irrigated hectare. The only explanation for such low yields on irrigated land is mismanagement.

I would like to call special attention to the situation with incorporating the new system of potato seed raising in Siberian regions. Local agricultural agencies have worked out and are implementing a comprehensive program to increase the production of elite and varietal seeds and to switch farms to exclusive use of varietal seeds. A system of farms for primary seed raising and production of elite potatoes has been reviewed and ratified. Scientific laboratories of the Scientific Research Institute of Potatoes have been set up at these farms. But we must acknowledge that whereas seed raising work in the Russian Federation has improved noticably in the last two years, in Siberia this is not the case.

An analysis of the work of the scientific institutions and farms shows that many of them are still producing low-quality elite material. They are still not making adequate use of the specialized methods developed and recommended by scientists for diagnosing and analyzing latent contamination of plants by viruses and bacteria. As a result, significant affliction of the plants by these diseases is the chief cause of crop losses in primary seed raising.

The system of distributing elite potatoes must also be revised. A significant share of the elite potatoes was distributed to the so-called seed raising farms which are supposed to reproduce the seed material of high reproductions and turn it over to the kolkhozes and sovkhozes for their seed plots. In reality the seed raising farms either "lose" the elite potatoes or excellent varietal material is sold to procurement workers for food purposes and processing. The new seed raising system, however, envisioned that five tons of elite potatoes would be turned over to each farm with market production for every 100 hectares of potato fields. At these farms the elite potatoes are supposed to be reproduced in seedbeds, and the second and third reproductions are planted in seed fields. In reality, however, this fundamentally new idea is not being practiced in Siberia.

In addition to improving the organization of primary potato seed raising, special attention should be devoted to improving varietal seed raising at the farms. Under the new system the times for permissible use of reproductions of seed potatoes under production conditions are now determined and strictly controlled. It is stipulated that kolkhozes and sovkhozes should not plant beyond the third or fourth reproduction. The new system prohibits planting tubers lower than the fifth reproduction.

Party and government documents have established firm times for the transition to varietal potato planting. This task must be accomplished by 1982-1983. In the current year a strict accounting must be made of all batches of seed from the first-phase reproductions available at farms in order to use it with maximum efficiency to reproduce and then distribute for seed purposes only. Varietal potatoes of high reproduction must be transferred on a broad scale from farms that have such potatoes to other farms that need them for reproduction. Unfortunately, many examples can be given of farms that sell varietal reproduction material for food purposes while neighboring farms are forced to plant nonvarietal seed.

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TILLING AND CROPPING TECHNOLOGY

UKRAINIAN FARMERS WEIGH TRADITIONAL PLOWING, MINIMUM TILLAGE

Moscow PRAVDA in Russian 28 Sep 80 pp 1-2

[Article by A. Voytovich, I. Lakhno, and I. Totskiy: "Testing in the Field"]

[Text] The harvest in the Ukraine this year was late and difficult. In many cases while the combines were still threshing the last windrows other machine operators had already begun planting winter crops. The concerns of the present harvest season were closely intertwined with concerns for next year's harvest. After all, the basic grain production of the republic is from winter crops. What reserves do they have for increasing fertility and raising the yield of each arable hectare?

"Late harvest." We heard these words everywhere, in Khar'kovskaya, Poltavskaya, Kiev, and Cherkasskaya oblasts, and they were spoken with concern and alarm. And certainly the alarm was justified! The late harvest set back some of the field jobs which republic agricultural workers usually do during the summer.

At the Bil'shovyts'ka Pratsya Kolkhoz in Karlovskiy Rayon, Poltavskaya Oblast the late harvest was not mentioned. We walked for a long time through a stubble field tilled with a subsurface cultivator and looked at the carefully prepared and fertilized fields. I asked what effect the late harvest had had on preparing the soil for winter crops.

"The subsurface cultivator saves us," N. Moroz, chairman of the board of directors, answered. "Especially when there is a late harvest. It is just as productive as a standard plow and reliably protects the soil against erosion. It also has other advantages. That is why we have switched to the 'no-moldboard' technique."

Nikolay Kuz'much has been in charge of the Bil'shovyts'ka Pratsya Kolkhoz for some time. It was on his initiative that they took the risk of testing the subsurface cultivator 13 years ago. The test was successful. Every hectare of the field tilled without a moldboard produced a significant gain in yield, 5.5 quintals of grain, compared to fields that were deep-plowed. Today the farm uses the no-moldboard technique not only for winter and spring grain crops, but also for corn, sunflower, feed crops, and sugar beets.

"Everywhere we get a gain in yield," the chairman points out.

The average annual wheat yield with the no-moldboard technique is 39 quintals per hectare at the kolkhoz in the 10th Five-Year Plan, seven quintals more than for fields tilled by traditional methods. Feed crops increased their yield by one-third, and for the farm this meant almost 10,000 tons of additional feed from the same planted area.

Today this kolkhoz is not alone; all the farms in Karlovskiy and Lokhvitskiy rayons have been convinced of the great economic efficiency of the new technology and have switched entirely to tilling without a plow. And they were right to do so. In Karlovskiy Rayon, for example, the average annual harvest of winter wheat using standard plowing was 32.5 quintals per hectare over the last decade, while for the no-moldboard technique the yield was 37.9 quintals a hectare. In some years the different yield was as much as seven quintals, while in others it was no more than three. One thing did not change; the difference was always in favor of the subsurface cultivator. Of course, this is assuming precise observance of all the requirements of scientific farming.

Poltavskaya Oblast has put about 1 million hectares under the no-moldboard system, and all grain crops as well as some of the feed and industrial crops are raised on this land. It has been calculated that in the last five years the no-moldboard technique helped grain growers receive hundreds of thousands of tons of additional grain. This gain and the reduction in soil tillage cost brought 51.7 million rubles to farms.

The farmers say that the southern grain crop takes shape in the fall. This means when the winter crops sprout. Many agronomists and machine operators with whom we talked during the harvest observed that in the old days they often failed to get good sprouts. A wet fall would save them, but a dry one would sometimes kill all their hopes for the harvest.

Statistics show that in the Eighth Five-Year Plan an average of one-third of the winter crop area had to be reseeded each spring in Zaporozhskaya Oblast. Many different explanations were given: freezing, drowning, the formation of an ice crust on the field. Without disregarding these causes of overwintering crop kill, after studying the matter specialists concluded that in large part the plow was indirectly responsible, or rather use of the plow in a stereotype manner even where it was not needed.

Deep plowing slowed down field preparation and delayed planting on fields freed after the harvest of late crops. But the main things were that a great deal of moisture was lost and wind erosion caused damage.

During the current five-year plan, despite the fact that three fall seasons were very unfavorable and dry, the average [illegible] replanting of winter crops has been cut by eight percent. Of course the general farming sophistication has risen at the kolkhozes and sovkhozes. Moreover, most of the farms that have become convinced of the advantages of minimum tillage have greatly expanded its application. The new technology has become "standard" on more than 600,000 hectares. The no-moldboard technique has played a definite part in the fact that the average annual gross grain yield during the current five-year plan is up 10 percent compared to the preceding plan; other farming techniques have been important also. In Zaporozhskaya Oblast the farmers believe that use of the subsurface cultivator guarantees them against winter losses. Farmers at many farms in Dnepropetrovskaya, Nikolayevskaya, Khersonskaya, and several other oblasts of the Ukraine have come to the same conclusion.

"In the fall we would plant about 30,000 hectares in winter crops," N. Kuz'menko, first secretary of the Tomakovskiy Rayon Party Committee of Dnepropetrovskaya Oblast, told us. "In the spring we would reseed one-third, some times even one-half. Many problems arose. It was a relief in 1975 when we used minimum tillage. Since then the winter crop area reseeded has not been more than 3,000-4,000 hectares, and in some years there has been none at all."

The opinion of specialists and party workers who are devoting considerable attention to the introduction of progressive technology is by no means unanimous. Nonetheless, many of them agree that the subsurface cultivator works better than the plow, especially in the dry steppe rayons.

The grain growers of the southern oblasts of the Ukraine have made subsurface tilling for winter crops one of their primary scientific farming procedures. The efforts of scientists and practical workers and the considerable work done by oblast party organizations and farm managers and specialists bore fruit. Year after year the new technology expanded its borders and the final result of its use enlarged the ranks of no-moldboard supporters. For the harvest of the final year of the five-year plan minimum tillage was used on almost 40 million hectares.

Is this a lot or a little? It is a lot if we consider that the no-moldboard technique has not even gone through the experimental stage in many rayons and oblasts and farmers have not even seen what the subsurface cultivator looks like. It is also a little, if we recall that about 14 million hectares of arable land in the republic have been subjected to wind and water erosion.

What is holding up broader use of minimum tillage and creating doubts in the minds of specialists? Let us listen to the views of the chief agronomists of several farms in Chernobayevskiy Rayon, Cherkasskaya Oblast.

N. M. Gritsenko, of the Zapovit Ilicha Kolkhoz, says "I'm convinced that deep plowing is not necessary after forerunners such as peas, corn, and annual grasses. But if you are applying organic fertilizer, you must use a plow."

Ya. A. Solonka, Pravda Kolkhoz, says: "We use minimum tillage for winter wheat in part of the planting area. Under our conditions the no-moldboard technique for other crops is ineffective, so we must plow."

N. P. Dzyuba of the Zarya Kommunizma Kolkhoz says, "In years with adequate moisture supply a field tilled by no-moldboard becomes flooded and there is a danger that the crops will drown."

In other rayons of the republic as well as Chernobayevskiy agronomists who have worked hard in the grain fields for decades argue about whether the plow or the subsurface cultivator is better. We even met outright skeptics who said that nothing good will come of all this business; the land has been plowed for centuries and without plowing it will become overgrown by weeds. Specialists at farms where the no-moldboard technique is already widely recognized do not deny that in the first years of its incorporation large numbers of weeds appear in certain fields. But they are easier to control in the topsoil layer than when they are driven deeper and stored.

Another unsettled dispute concerns whether to use a plow or subsurface cultivator with the application of organic fertilizer. Some specialists say that the subsurface cultivator destroys the manure while others reject this and carry on bold experiments that are producing good results.

"The truth comes out of argument," I. Mozgovoy, secretary of the Central Committee of the Ukrainian Communist Party, observed in conversation with us. "But there is no argument about one thing. We must not take a superficial approach, relying entirely on intuition, with the no-moldboard technique or any other method of tillage. Tilling without a plow is just one element of the composite set of scientific farming practices and where it is introduced we will need thorough scientific study and development, a creative and rigorously differentiated approach, and painstaking work to raise the general sophistication of farming practices. The chief measure must be yield per hectare of arable land. We have analyzed the results of 325 tests made by scientific research institutes and testing stations. The studies show that the no-moldboard technique can be used on significant areas in the Ukraine that are subject to wind and water erosion. We are continuing to study this tillage procedure. After all, the land and conditions differ, and of course this must be considered by farm specialists and managers when selecting production technology and choosing each particular scientific farming practice. So the farmers need the plow, the subsurface cultivator, and other equipment as well."

How much increase will there be in the use of the no-moldboard technique in coming years? In five years, specialists figure, the area tilled without moldboards should more than double.

At the same time some farms are showing caution. This is entirely understandable. The psychological barrier against the subsurface cultivator has not been overcome everywhere and the necessary experience has not been accumulated. Many grain growers complain that there are not enough scientific projects and recommendations.

The farmers are right. Some scientific institutions in the republic which are expected to test out new technology in farming have been delaying research on the effectiveness of no-moldboard tillage and are slow to produce recommendations.

Specialists at some farms would take the risk of expanding the no-moldboard area, but where could they get antierosion implements? According to A. Karpinskiy, deputy chairman of the Ukrainian SSR Goskomsel'khoztekhnika, deliveries to the republic in the current five-year plan are short 4,300 SZS-2.1 planters and 4,400 BIC-3 needle-type harrows. The requests of kolkhozes and sovkhozes for stubble and grain-pressing planters have only been 59 percent satisfied.

What is the reason for this? One of the main reasons is that the capacities to produce this equipment are being built too slowly. It is no accident that the Ministry of Agricultural Machine Building is planning the production machinery in 1981 in much smaller volume than envisioned in their assignment. Only 12 of the 24 machines included in the "machine system" are being manufactured; six of the others have not been launched in production, and the other six are only now going through state testing.

With the no-moldboard technique being applied in the republic on the scale envisioned in the 11th Five-Year Plan it will be necessary to expand the training of agricultural machine operators and grain growers and raise their qualifications. Who will carry on this important cause if the future agronomists, when they graduate, do not understand the new technology well (only a few hours are assigned to it in present syllabi). This is something for the involved ministries and departments to think about.

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TILLING AND CROPPING TECHNOLOGY

RATE, QUALITY OF AUTUMN PLOWING IN BELORUSSIAN SSR 'UNSATISFACTORY'

Minsk SEL'SKAYA GAZETA in Russian 1 Oct 80 p 3

[Article by A. Chizh, chief of department at Ministry of Agriculture for Belorussian SSR and F. Tsyganov, department head at the Central Scientific Research Institute of Rural Mechanization and Electrification of the Non-Black Earth Belt of the USSR: "Higher Rates for Autumn Plowing"]

[Text] If you please, there is no need for discussing in detail the importance of autumn plowing schedules and quality, in connection with the degree to which they affect future spring crop yields. A difficult situation arising from the harvest campaign, autumn sowing or the potato harvest must not be viewed as justification for a lag in the plowing work. The observance of the proper schedules is considered to be an important lever for raising the culture of farming. Timely autumn plowing operations make it possible to combat weeds successfully, especially couch grass, and to realize an increase in the return from all fertilizers applied.

However, the rates and quality of this work are still unsatisfactory. According to the situation on 25 September, autumn plowing had been carried out on one half of the areas designated for such work only on the farms in Zhitkovichskiy and Khoynikskiy Rayons. From 46 to 40 percent of the autumn plowing work was completed in Kletskiy, Pinskiy, Kopyl'skiy and Braginskiy Rayons. In other rayons, this indicator was considerably lower. The cause -- poor work organization in the various areas and weak agrotechnical control on the part of the specialists. The tractors in almost all areas, even the more powerful ones, were being employed for plowing work on a single shift basis. In Vitebskiy, Verkhnedvinskiy, Postavskiy and Braslavskiy Rayons, less than 10 percent of the autumn plowing work called for in the plan had been completed; this level was somewhat higher in Berestovitskiy, Lidskiy, Oshmyanskiy, Molodechnenskiy, Shklovskiy and Osipovichskiy Rayons. By this date in Kalinkovichskiy Rayon, plowing had been carried out on 14 percent of the areas, while at the Kalinkovichskiy and Bereznyanskiy sovkhozes in this same rayon -- autumn plowing had still not been carried out on one hectare.

An inspection revealed that the quality of the work was sub-standard. Poorly harvested straw was clogging up the plows and, as a result, many irregularities developed on the soil's surface. Many machine operators, in commencing their work, marked off the strips by eye and adjusted their units in a very poor manner -- such factors lower the quality of the soil preparation work. The absence of agronomic control over the rates and quality of the work can exert an adverse effect on the future harvest.

The requirements imposed with regard to quality are high and yet they are fully attainable if the work is carried out in a conscientious manner. Many examples of skilful autumn plowing work could be cited. Here is just one of them. At the Kolkhoz imeni Chapayev in Pruzhanskiy Rayon, tractor operator Ivan Matskevich operates a T-74 tractor with PN-4-35 plows. It marks off the tracts in an accurate manner, plows up the headlands and makes crown and split ridges in the correct manner. During the past 2 days, it carried out autumn plowing on 25 hectares.

In recent years, anti-erosion tilling of the soil, with the assistance of KPG-2.2 type sweeps and heavy disk harrows, has been carried out on an increasing scale. In the case of sweep tilling of the soil, non-mouldboard loosening of the soil (instead of mouldboard plow loosening) is carried out, with the post-harvest plant residues being left on the surface and in the upper soil layer in the form of mulch. Such mulch ensures the best absorption of precipitation and at the same time it prevents the development of erosion processes and the washing away of fertilizers. Importance is also attached to the fact that anti-erosion tillings raise the fertility of soils roughly by 1 point annually and the cropping power of crops by 10 percent.

The productivity of these machines is 1.5-2 times higher than that for plows. In all instances the disking of the soil must be carried out in two tracks and in a crosswise direction. The machine operators and agronomists must monitor the situation very carefully so as to ensure an overlapping of the operating width of the plow. This will serve to uphold the quality of the work and at the same time it will ensure the cutting of all weeds.

Experience has shown that it is impossible at the present time to carry out large volumes of work, in a high quality manner and on a rapid basis, in the absence of group utilization of equipment -- seasonal technological detachments and teams of machine operators headed by agronomists and engineers. Only in such detachments will it be possible to achieve high technological discipline, good technical and routine services and also the use of moral and material incentives. At the Kolkhoz imeni Lenin in Volozhinskiy Rayon, for example, more than 60 percent of the autumn plowing work has been completed. Here the equipment has been grouped together in a team, the work is being controlled in an efficient manner and fine technical servicing of the machines has been organized.

An extensively organized and well publicized socialist competition serves as an important stimulus for raising the productivity of the work. Greater use should be made of the experience of those farms which, for the purpose of raising the interest of the machine operators, issued bonuses on an extensive scale using the material incentive fund.

It should also be borne in mind that, in conformity with the norms, machine operators carrying out cultured plowing work using plows with skim coulters should be paid at the next highest rate.

A great amount of work still remains in connection with preparing the autumn fields. For the republic as a whole, this work has been completed on 23.4 percent of the areas. The indicators for Vitebskaya Oblast are especially low. The autumn plowing operations must be stimulated in every possible way -- sufficient means and methods are available for realizing such intensification. Success can be achieved in carrying out this work in the various areas through a high level of organization and productive use of the equipment. It should be remembered that good autumn plowing provides the foundation for the future harvest.

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TILLING AND CROPPING TECHNOLOGY

MEASURES FOR IMPROVING AUTUMN PLOWING RATES IN BELORUSSIAN SSR

Minsk SEL'SKAYA GAZETA in Russian 26 Oct 80 p 2

[Excerpts] The Board of the Ministry of Agriculture for the Belorussian SSR has examined the course of the field work being carried out on kolkhozes and sovkhozes in Grodnenskaya Oblast and the measures aimed at accelerating the completion of such work. In addition, it took note of the serious shortcomings observed in the autumn plowing work being carried out on farms in Vitebskaya Oblast. Reports were delivered in this regard by the deputy chiefs of the agricultural administrations of the Grodnenskaya and Vitebskaya oblast executive committees, M.A. Germanovich and V.S. Tikhonov.

A similar situation prevails on farms in Vitebskaya Oblast with regard to autumn plowing. By 20 October and against a plan calling for 496,000 hectares to be prepared, only 295,000 hectares or 59 percent of the plan had been plowed here. The lag in autumn plowing was especially great at kolkhozes and sovkhozes in Gorodokskiy, Verkhnedvinskiy, Sharkovshchinskiy and Postavskiy Rayons, where only 25-35 percent of the areas had been plowed.

The majority of the farms in the oblast were considerably late in commencing their autumn plowing. Only a small number of tractors were included in the work and double-shift operation of the equipment was not organized. Notwithstanding an acute shortage of machine operator personnel on the kolkhozes and sovkhozes, the agricultural administrations of the oblast executive committee and the rayon executive committees failed to enlist the services of machine operators from supporting organizations for the purpose of carrying out the autumn plowing work. It was for these reasons that from 4 to 12 tractors lay idle on the days that inspections were carried out at the Zaronovo Sovkhoz and the Znamya Lenina, imeni Suvorov and Dvina kolkhozes in Vitebskiy Rayon, at the Bol'shevik Kolkhoz in Postavskiy Rayon and at the imeni Suvorov and imeni Lenin in Gorodokskiy Rayon. On the whole, 11-12 percent of the available tractors are being employed daily for autumn plowing work on farms in Vitebskiy Rayon and only 16-18 percent on the farms in Verkhnedvinskiy, Gorodokskiy and Dubrovenskiy Rayons.

The work being performed by the Agricultural Administration of the Vitebskaya Oblast Executive Committee in connection with organizing the autumn plowing work is considered to be unsatisfactory. The deputy chiefs of the Vitebskaya Oblast

Agricultural Administration were informed that they were not exercising proper control over the course of the autumn plowing work.

The chiefs of the agricultural administrations of the Grodnenskaya Oblast Executive Committee and the rayon executive committees were tasked with undertaking urgent measures aimed at completing all field work no later than 1 November and organizing double-shift operation of the potato harvesting machines for the replowing of the potato fields and the beet harvesting machines for harvesting the sugar beets, the tractors for carrying out the autumn plowing and the transport equipment for transporting the agricultural products.

They are also tasked with organizing an interenterprise and interrayon exchange of flax and potato seed, such that each farm will have laid away sufficient amounts by 1 November of this year. In addition, daily control must be exercised over the course of all sales of agricultural products to the state.

The Board has required the agricultural administrations of the Vitebskaya Oblast Executive Committee and the rayon executive committees to undertake immediate measures aimed at completing the autumn plowing work by no later than 1 November of this year.

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MUNICIPALITIES AS SUPPLIERS OF ORGANIC FERTILIZER

Moscow ZHILISHCHNOYE I KOMMUNAL'NOYE KHOZYAYSTVO in Russian No 7, Jul 79 pp 12-13

[Article by V.V. Kaznoshchik, Candidate of Technical Sciences and acting head of a department at the Academy of Municipal Services imeni K.D. Pamfilov and I.S. Turovskiy, Doctor of Technical Sciences and head of a laboratory at NIIKVOV: "Municipal Economy -- A Supplier of Organic Fertilizers"]

[Text] The long-term program for agricultural development, which is being carried out at the present time, calls for an increase in the production of mineral fertilizers and an expansion in the use of organic fertilizers.

The municipal economy has great reserves at its disposal for solving this task.

In recent years, installations have been erected at an intensive rate throughout the country for the purification of municipal and industrial sewage water and for neutralization and composting of solid domestic waste products. Moreover, methods for processing the sediment of sewage water and domestic waste products are being introduced into operations on a more extensive scale. These methods are making it possible to increase the use of this sediment and waste products in the national economy, particularly in the form of organomineral fertilizer.

In 1975 the amount of sediment obtained during the purification process for municipal sewage water amounted to 66.5 million cubic meters annually, or 2.4 million tons of dry substance and for the period under review it is increasing in terms of both overall volume and dry substance. Accordingly, the accumulation of solid domestic waste products during 1975 amounted to 35 million tons and further increases are expected for these indicators during the decade.

An effective technology for obtaining quality standardized fertilizer from the sediment of municipal sewage water has been developed at NIIKVOV of AKKh [Academy of Municipal Services], in collaboration with a number of specialized organizations. It includes the reagent dehydration of a mixture containing sediment from primary settling tanks and surplus active silt, on vacuum filters, or non-reagent dehydration on horizontal settling screw conveyer centrifuges and subsequent thermal drying, decontamination and fractionation in dryers having opposing jets or decontamination in dehelminthization chambers.

This technology makes it possible to obtain a semi-dispersed product and one which, as fertilizer, is not inferior to a dried out fermented sediment. Moreover, compared to the traditional method for fermenting sediment in methane tanks and drying carried out on silt platforms, the use of such sediment brings about considerable reductions in capital and operating expenses and also in the space required for the purification installations.

Thermally treated sediment, similar to compost, appears as a firm free-flowing material having particles 1-7 mm in size. It is applied uniformly to the soil using any machines or mechanisms employed for this purpose in agriculture.

The thermally dried out sediment was tested on vegetable and grain crops and also on perennial grasses in Moscow, Minskaya, Vladimirskaya and Leningrad oblasts. The studies revealed its high neutralizing effect on soil acidity. A special effect was obtained on an initial reclamation tract of former peat bogs and medium-tamed sod-podzolic sandy loam soil. As a result of the application of gradually increasing dosages (to 80 tons per hectare), the reaction of the environment in a salt extract of soil changed over the course of a year's time from very acid to neutral.

For dosages of from 10 to 80 tons per hectare, considerable increases in yield were obtained for winter wheat in Vladimirskaya Oblast, potatoes in Leningrad Oblast and oats and cabbage in Moscow Oblast. An increase in the cropping power of the crops was observed not only during the first but also during the second year following the application of sediment to the soil.

The highest (doubled) yield was obtained when the thermally dried sediment was used in combination with compound nitrogen-phosphorus-potassium fertilizer.

Comparative studies were also carried out. They revealed that the sediment is not inferior to farmyard manure or mineral fertilizers, when the latter are applied in the usual dosages. When winter wheat was grown in Vladimirskaya Oblast on sod-medium podzolic sandy loam soil, with sediment and peat-manure being applied at the rate of 15 tons per hectare and compound fertilizer -- nitrogen, phosphorus and potassium -- at the rate of 90 kilograms, a yield of 42 quintals per hectare was obtained in the first instance and in the second -- 43.1 quintals per hectare. In Moscow Oblast, on peat bog soil, a yield of 38.8 quintals of winter wheat per hectare following an application of thermally dried sediment (80 tons per hectare) and 27.2 quintals per hectare following an application of mineral fertilizer (nitrogen, phosphorus and potassium at the rate of 200 kilograms).

The utilization of sediment, which serves to raise the fertility of soils, also prevents irrational discharges into waste dumps and it thus raises the degree to which the environment is protected against pollution.

The first shop for the mechanical dehydration and thermal drying of sediment was created in Orekhovo-Zuyevo in Moscow Oblast. Similar subunits are presently being created at enterprises for the purification of sewage water in Klin, Kolomna, Voskresensk, Leningrad and Brest.

However, the sediments may contain excessive amounts of heavy metal salts and certain chemical compounds. In such instances, reliable local means of purification should be created. Insufficient knowledge is available on the potential use of sediment containing toxic substances and further study is required before solving the problem concerning their utilization in agriculture.

In this regard, use is being made at the present time of "Temporary Technical Conditions for Thermally Dried Sediments, Used As Fertilizer." These conditions were coordinated with the USSR Ministry of Public Health and the USSR Ministry of Agriculture and approved by the RSFSR Minzhilkomkhoz [Ministry of Housing and Municipal Services] for the period up until 1 January 1981.

Based upon an approximate estimate, when extensive use is made of the sediment treatment technology, including mechanized dehydration and thermal drying, agriculture will annually be supplied with up to 15-20 million tons of fertilizer. The economic savings, estimated on the basis of the amount of standard income, will amount to more than 100 million rubles annually.

At the present time, the sediment obtained from municipal sewage water is being used mainly for technical crops and also for the recultivation of lands following industrial use, for forest restoration work and also for municipal landscaping work.

Distinct from the sediment obtained from sewage water, solid domestic waste products do not require drying out as a rule, since their moisture content for the greater part of the year is 40-50 percent. A technology for converting them into organic fertilizer was created at AKKh. It includes the following principal phases: preliminary preparation (creation of a uniform flow and separation of the ferrous scrap metal), rendering harmless and processing in biological drums having a definite regime for rotation and aeration, removal of non-composted fractions larger than 50-60 mm and crushing of glass.

The planning for plants which will employ this technology is being carried out by Giprokommunstroy [RSFSR State Republic Institute for the Planning of Municipal Construction and the principal equipment -- a biological drum -- developed by VNIIKommunmash [All-Union Scientific Research Institute of Municipal Machine Building] (Leningrad) and the Volgotsemmash [Volga Plant for Cement Machine Building] (city of Tol'yatti).

The leader in domestic equipment -- the Leningrad plant -- placed in operation in 1971, has already furnished those farms engaged in early vegetable production with 500,000 tons of fertilizer and biological fuel. These products were valued very highly at the Krasnaya Slavyanka, Predportovyy imeni Zhdanov, Pobeda, Fedorovskiy and Krasnyy Oktyabr' sovkhozes.

In 1972, such a plant commenced operations in Moscow (it has already sold 250,000 tons of compost) and in 1977 -- in Tashkent. Today, similar enterprises are being erected in Minsk, Alma-Ata, Gor'kiy, Riga, Tbilisi and Khar'kov. The plans for such plants are being prepared for Saratov, Kuybyshev, Volgograd, Tol'yatti, Ryazan', Baku and Kutaisi.

The agricultural scientific-research organizations, jointly with the AKKh, are studying the conditions under which the compost is to be used. It has been established that it surpasses peat-mineral-ammonia fertilizers in terms of quality.

According to data supplied by NIIOKh [Scientific Research Institute of Vegetable Growing] and LPOOS [Leningradskoy plodo-ovoshchnoy opytnoy stantsii; Leningrad

Fruit and Vegetable Experimental Station], it is economically profitable and advisable to employ compost on open ground at the rate of 20-40 tons per hectare, depending upon the crop being grown, in combination with mineral fertilizers (120 kilograms of nitrogen, 60-120 kilograms of phosphorus and 120-180 kilograms of potassium).

It is recommended that the compost be used on open ground for potatoes, tomatoes, cabbage, beets and carrots. On protected ground, the biological fuel obtained from waste products is employed to good advantage for the growing of early cucumbers, tomatoes, radishes and green crops (dill, salad greens, spinach).

The workers at LPOOS computed the economic effectiveness of the compost, taking into account its residual effect. For a planting of early cabbage as the principal crop and carrots as the subsequent crop, compost was applied at the rate of 25 tons per hectare, with the addition of 120 kilograms of nitrogen, phosphorus and potassium. In 1973 and 1974, the increase in yield was such that all expenditures were repaid by threefold.

In addition to valuable components, the compost contains, in microdosages, the undesirable salts of heavy metals, which naturally are found in the soil. Computations have shown that no more than 1-2 percent of the elements in the arable layer are introduced in this manner.

An active biothermal process involving the release of heat takes place in dampened solid domestic waste products which have been rendered harmless. Thus these products are used as a biological fuel for the heating of hothouses and hotbeds. When used properly, these products can result in vegetable yields being obtained 5-12 days earlier than if farmyard manure had been applied or solar heating employed (data obtained from LPOOS and the Timiryazev Agricultural Academy).

If compost fertilization creates favorable conditions for the cultivation of early vegetables (more rapid warming of the soil, raised CO_2 content, optimum temperature regime), then the tomato yield will surpass that obtained from the use of farmyard manure by 30 percent, cucumbers -- by 25 percent and green crops -- by 7-12 percent.

As a rule, the waste products employed as biological fuel are subsequently used a second time by the sovkhozes -- as organic fertilizer -- and thus a twofold advantage is realized.

At the AKKh, "The Technical Conditions for Compost Produced At Garbage Processing Plants and For Its Use" (Department of Scientific and Technical Information, AKKh, 1976) were composed. This document was coordinated with the USSR Ministry of Agriculture and the USSR Ministry of Public Health and approved by the RSFSR Minzhilkomkhoz. At the present time, the "Principal Rules for the Operation of Garbage Processing and Garbage Disposal Plants and the Conditions for Their Acceptance of Solid Domestic Waste Products" are under preparation.

According to estimates, 30 such plants producing more than 1.8 million tons of organic fertilizer and biological fuel annually are capable of meeting the requirements for 100,000 hectares of fields at suburban sovkhozes and kolkhozes and thus raising the cropping power of such fields by 25-30 percent.

Studies are presently being carried out at the AKKh for the purpose of ascertaining the possibility of processing solid waste products together with the sediment of sewage water. Such a technology would make it possible to improve the quality of the products being produced and reduce the expenditures for power and labor resources.

The extensive introduction of methods for the mechanical dehydration and thermal drying of the sediment obtained from sewage water and the composting of solid domestic waste products, with the products so obtained being used as fertilizer, will promote an increase in the fertility of soils and prevent environmental pollution.

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TILLING AND CROPPING TECHNOLOGY

BRIEFS

SEED STORAGE WORK--Minsk, 13 Oct--The farmers of Belorussia are establishing a reliable foundation for the future harvest of grain crops. They have completed their laying in of seed and in quantities sufficient not only for the spring fields but also for resowing the winter fields if required. More than 500,000 tons of seed for barley, wheat, oats and other crops have been placed in storage. The seed is being cleaned, graded and raised to a high condition. Special attention is being given to this important work. Indeed the grain, owing to frequent rainfall and cold weather, is more puny and its moisture content higher than usual. All of the kolkhozes and sovkhozes have placed forced ventilation units in operation, equipped their thrashing floors with ground-type troughs and turned on their air heaters and heat generators. The industrial technology is ensuring high quality seed preparation and it is making it possible to expand the interenterprise and interrayon exchange of seed and to supply the fields with more productive varieties and in a more rapid manner. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 14 Oct 80 p 1] 7026

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